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REMARKS

The present invention is directed to the discovery that hydrocarbon fuel suitable for use in spark ignition engines, i.e., gasoline that has a low nitrogen content and consequently low lubricity can have its lubricity improved by the addition thereto of a minor quantity of ethanol. The low nitrogen content fuel (i.e., base gasoline) which constitutes the base fuel of the present invention has a nitrogen content of about 5 wppm or less as determined by method ASTM-D 4629-96 (exclusive of any nitrogen attributable to additives). The amount of ethanol added to the low nitrogen content base gasoline is at least 2 vol% ethanol to about 20 vol% ethanol based on the total volume of the blended fuel. That the lubricity of gasoline which has a low nitrogen content is improved by the addition of ethanol is totally unexpected and contrary to what is usually observed upon the addition of ethanol to gasoline; a decrease in lubricity is the usual result of the addition of ethanol to base gasoline containing a greater amount of nitrogen compounds.

The Examiner repeats the rejection of claims 1-18, 36, 37 and 39 under 35 USC §103(a) as unpatentable over Scott, et al. (USP 6,290,734) in view of Hamner (USP 4,875,992).

The Examiner argues that Scott teaches a fuel composition comprising gasoline and about 10 vol% of ethanol. The composition has a Reid Vapor Pressure of no greater than 7.0. The Examiner acknowledges that Scott does not specifically disclose the amount of nitrogen in the fuel.

The Examiner relies on Hamner as disclosing a process for removing nitrogen from a hydrocarbon feed to produce a product comprising less than about 1 ppm of nitrogen.

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From this the Examiner draws the conclusion that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Scott by removing nitrogen from the fuel as taught by Hamner because, if there is any nitrogen present in the fuel, one of skill in the art would employ the removing step of Hamner to remove unwanted nitrogen from the fuel because the removing step of Hamner is effective to reduce the amount of nitrogen content in the fuel (to) less than 1 ppm." (Emphasis added)

The Examiner dismisses Applicants arguments submitted in the Amendment of June 20, 2003, as not persuasive. The Examiner comments that he used the Hamner reference to show that removing nitrogen from a hydrocarbon feed is known in the art and it would be expected that the results of removing nitrogen from a hydrocarbon feed would be the same or similar whether the hydrocarbon feed is a light hydrocarbon feed or a heavy hydrocarbon feed. The Examiner reminds us that he is not using the product of Hamner in the Scott process, but is using Hamner only to show a denitrogenation process.

The Examiner dismisses Applicants arguments as non-persuasive that Scott is silent on the nitrogen content of the gasoline and provides no motivation for the removal of nitrogen from gasoline because it appears to the Examiner that the gasoline of Scott does not contain nitrogen and even if it did one of skill would use any known method, including that of Hamner, "to remove nitrogen from gasoline if one desires." (Emphasis added)

Applicants must respectfully traverse this rejection and the dismissal of their earlier arguments.

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The Examiner cited Scott, et al. as a teaching on gasoline. The silence of Scott regarding the nitrogen content of gasoline should not and cannot be interpreted as an indication that the gasoline of Scott did not contain nitrogen. All such silence can be and should be seen as teaching is that the nitrogen content of gasoline is a characteristic which is not normally measured.

Even though the reduction in NO_x in the new reformulated gasoline of Scott is identified as important, the presence of nitrogen and the nitrogen content of the gasoline itself is not reported or heretofore measured because the generation of NO_x from the combustion of gasoline is attributable not from the nitrogen compounds present in the gasoline but from the N_2 in the air used for the combustion of the gasoline. Air is about 80% N_2 and 20% O_2 . Consequently, there is no reason to remove any of the nitrogen compounds from the gasoline nitrogen is not an "unwanted" material or one which has to be removed. Their removal would have an insignificant impact, if any impact at all, on the production of NO_x .

Scott teaches that RVP, sulfur, oxygen, aromatic hydrocarbons, benzene and olefins are all measured and specifications are set for each in the gasoline, but there is not specification for nitrogen, because as previously indicated there is no motivation for controlling or reducing the nitrogen content of the gasoline because the nitrogen source for the NO_x produced by the combustion of gasoline is atmospheric nitrogen, not the nitrogen compounds present in the base gasoline.

In the last sentence of the Examiner's comments at page 4 of the present rejection, the Examiner states that even if the gasoline of Scott contains nitrogen one of skill in the art would use any known method including that of Hamner to remove nitrogen from gasoline "if one desires."

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The phrase "if one desires" is an important one to the understanding of the present invention.

Because the major nitrogen source for the NO_x produced by the combustion of gasoline is atmospheric nitrogen and not the nitrogen compounds present in the gasoline, there is no motivation to practice any denitrogenation process on gasoline be it Hamner's process or any other denitrogenation process, that is, there is no basis for any practitioner to desire to deliberately practice such a process on gasoline. Nitrogen compounds in gasoline are neither a wanted nor an unwanted compound

It is not enough and should not be enough for the Examiner to merely indicate that a process step such as denitrogenation exists and can be practiced on hydrocarbon feeds, there must also be shown a motivation or reason for practicing such a process in a particular instance.

In the present case, no such motivation or reason has been presented or shown to exist. One skilled in the art has no reason for practicing a denitrogenation step on gasoline. If the nitrogen content of gasoline was important or its control served a purpose, Scott would have reported that a nitrogen specification existed for gasoline. This he did not do because no such specification exists and one does not spend money or effort to practicing a process unless it is either necessary or serves some purpose.

Applicants arguments, interpreted by the Examiner as a criticism that the Examiner's conclusion of obviousness is based on improper hindsight reasoning, was not intended as and should not have been interpreted as an argument that obviousness does not have as an element the integration of prior art knowledge.

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However, there must be some motivation for the integration of different pieces of art. While Scott is directed to gasoline, Hamner is not directed to gasoline when he practices the denitrogenation process.

As indicated above, there appears to be no motivation for the practitioner skilled in the gasoline processing art to practice a deliberate denitrogenation step on gasoline or to deliberately reduce the nitrogen content of gasoline at all, let alone to a point of only 5 wppm nitrogen compound content.

Only with the present specification before him would one, learning that the lubricity of gasoline which has a low nitrogen content for whatever reason (5 wpm or less exclusive of nitrogen attributable to additives) can be improved by the addition thereto of ethanol, have any motivation to produce a particular gasoline fuel comprising ethanol and a base gasoline suitable for use in a spark ignition internal combustion engine which gasoline has a nitrogen content exclusive of nitrogen attributable to additives, of about 5 wppm or less.

There is no motivation to produce low nitrogen content gasoline and equally there is no motivation in the literature to add ethanol to a gasoline which has for whatever reason a low nitrogen content.

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It is believed that the present invention is not taught, suggested or implied by the act. It is requested that the Examiner reconsider his position in this case, withdraw the rejection, allow the claims and pass the case to issue in due course.

Respectfully submitted,



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☒ Pursuant to 37 CFR 1.34(a)

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